

Mental health screening before troop deployment

Is not supported by current evidence

Research p 991

The United Kingdom and United States have a long history of trying to identify mental health problems among troops to be deployed. Since the first world war, a series of psychological screening programmes have been implemented, but none has been successful in providing a more capable combat force.¹ Nevertheless, there is an understandable interest in developing new screening strategies to reduce the psychological morbidity of troops currently serving in Iraq and Afghanistan.² In this week's issue, Rona and colleagues report the effects of screening troops for mental health problems before deployment to Iraq.³

Two major approaches to predeployment screening exist. The first is to identify troops who are already experiencing debilitating medical and psychological illnesses just before deployment. The advantages of not sending sick troops into a conflict are obvious. These screening programmes are therefore useful, provided they accurately identify troops who need health care, are cost effective, and do not hinder demanding deployment preparations. The second is to identify soldiers who are considered healthy but who have a "propensity" to break down in battle or develop chronic psychological problems.

The study by Rona and colleagues evaluates the second approach and finds that a screening questionnaire administered to troops before deployment to Iraq was possibly useful for identifying post-traumatic stress disorder but not for other mental disorders.³ The marginal benefit was partly because the frequency of mental health problems was low among these troops, which is a common problem in screening generally healthy military populations.

The UK and US military already use a rigorous selection strategy that greatly reduces predeployment morbidity. This process begins with high induction standards, which ensure that most recruits are physically healthy and can complete basic education. Qualified recruits then undergo basic training, which severely tests physical and mental abilities. Although exceptions exist, important health problems become obvious to drill instructors during the rigours of basic training and result in early discharge.

Newly trained troops usually do not head directly to war, so the military has the opportunity to assess mental fitness further. Troops have to prove that they can cooperate in team efforts and perform complex tasks in confusing circumstances. In contrast to actively serving troops, reserve and National Guard personnel are not observed daily, but they still have to complete

basic training, after which they typically serve on active duty for several years and then engage in periodic training exercises.

When troops reach the battlefield, this multilayered selection process has already produced a combat force with a high level of mental and physical health. The effectiveness of this process has been clearly demonstrated and labelled the "healthy warrior effect." Veterans of the first Gulf war provide a good example of how military service successfully produces fit combat troops. Since 1991, the mortality rate of 700 000 US Gulf war veterans has been less than half that of the civilian population.⁴ British veterans of the Gulf war have also had favourable mortality rates despite wartime trauma.⁵

For predeployment screening to be justified, it must identify troops who have disqualifying conditions, but who have not already been eliminated by a lengthy process that selects healthy troops. Consequently, it has been difficult to show that mental health screening adds value. The usual benefits of health screening are less apparent in young combat troops than in the general population, which has greater unmet medical and social needs.

The second approach to predeployment screening, which identifies troops who are not having mental health problems but who are more likely to break down in battle or develop chronic psychological problems, is more controversial. Since the first world war, such efforts have been unable accurately to identify



individual soldiers who will develop mental disorders.¹ However, based on factors like educational level and rank, they have identified military populations at higher risk of psychiatric breakdown. But even within these at risk populations, most soldiers perform as well in combat as others.^{6 7}

Predeployment screening is intended to reduce psychological morbidity and improve combat effectiveness by identifying vulnerable people and categorising them as unfit for military duty. An unavoidable side effect of this screening approach, however, has been that many people have been inaccurately classified as being psychologically impaired. What effect this has had on their self perception and subsequent lives is unknown, but the military definitely lost a substantial proportion of its workforce.⁸

Because screening has repeatedly failed to predict psychological vulnerability, other health measures should be emphasised, such as increased access to health care and elimination of the stigma associated with treatment for psychological conditions.² Moreover, no comparable screening programme in non-military populations supports this approach. Because of the complexity of human nature, human behaviour

has not been consistently predicted in any walk of life, let alone on the battlefield.

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The lesser known effects of statins

Benefits on infectious outcomes may be explained by “healthy user” effect

Statins reduce the risk of vascular events and are also cost effective.¹ In recent years, non-randomised studies have linked statins with a list of biologically diverse actions, indicating that statins have pleiotropic effects.^{2 3} For severe infections—such as pneumonia, sepsis, or bacteraemia—at least six studies have linked statin use with decreased (to one third or less in some reports) risks of severe sepsis or death; this has caused great excitement among infectious disease and intensive care physicians.^{4 5}

In this issue of the *BMJ*, Majumdar and colleagues report outcomes in 3415 Canadian patients with community acquired pneumonia.⁶ They found that statins slightly reduced the risk of in-hospital mortality or admission to intensive care (crude relative risk 0.80). However, statin users may be “healthy users,” because younger, healthier, better educated, and socioeconomically more privileged people may be more likely to receive preventive treatments than less privileged frail people.⁷ After controlling for measures of the “healthy user” effect (including up to date immunisations, quitting smoking, and walking unaided) and a propensity score for statin use, the relative risk among statin users increased to 1.10 (95% confidence interval 0.76 to 1.60).

Why were the findings by Majumdar and colleagues different from earlier studies? Their study was population based and thus likely to represent statin users in daily clinical practice, rather than those followed by university hospital specialists. Furthermore, unmeasured socioeconomic confounding is less likely to occur within the Canadian state sponsored healthcare system than, say, in the United States. Their

results corroborated the findings of unaltered short term mortality among statin users with bacteraemia reported in Denmark, which has a similar healthcare system.⁸ Finally, the investigators measured and controlled for a wide range of healthy user markers, which further reduced the likelihood of residual confounding.

Does this mean that we can write off any additional benefits of statins? Not entirely, as the Canadian study does have limitations. Of note, statin users had a lower risk of admission to intensive care or death (crude relative risk 0.80), despite being older, having more comorbidities, and using more drugs. It is odd that controlling for these variables lowered the apparent protective effect instead of augmenting it. This could be an artefact of using the composite endpoint of risk of admission to intensive care or death, as older age and more comorbidity may “protect” against admission to intensive care.⁶ Controlling for severity of pneumonia among statin users decreased the protective effect further. Pneumonia may have been less severe in statin users because they are more likely to come to the attention of the healthcare system than non-users. Alternatively, statin use itself may affect severity, in which case severity should not be controlled for. In addition, the analysis included only in-hospital mortality. In patients with severe infections, the beneficial effect of statins may become apparent after the first few weeks of use, when the protective effect against sustained vascular events triggered by inflammation may be the greatest.⁸

Nevertheless, in an area susceptible to publication bias, Majumdar and colleagues should be congratu-

Research p 999

BMJ 2006;333:980-1

lated for publishing an important “negative” study. The current abundance of “positive” observational studies might tempt drug companies to promote statins on the basis of their presumed diverse beneficial effects, without supporting evidence. This would be unwise, as is discussed in another paper published online in the *BMJ* (10.1136/bmj.39006.531146.BE).⁹ We have learnt from the lessons of hormone replacement therapy and antioxidants (when some doctors and drug companies prematurely recommended drugs on the basis of positive observational studies) that therapeutic recommendations should not be based solely on animal studies, plausible biological mechanisms, and findings from observational studies. Large meta-analyses of trials have shown that serious adverse events with statin therapy are rare.¹⁰ Currently, for patients admitted to hospital with severe infections, it seems sensible to continue statins in those already receiving them¹¹ until convincing results from randomised trials prove otherwise.

Hospital admissions for sepsis and pneumonia are on the rise in ageing Western populations,¹² and positive results from statin therapy trials would have important public health implications, given the availability and relatively low cost of these drugs.⁵ Such trials should enrol not only selected groups of young and otherwise advantaged patients (as has often been the case for sepsis, for example) but also those who bear most of the disease burden—elderly patients with multiple morbidities. Well designed observational studies may also contribute to our understanding of the issue if they eliminate or quantify biases by collecting data on confounding factors and applying modern epidemiological techniques, including propensity scores and sensitivity analyses.⁷ Long term observational studies of statin users examining cardiovascular outcomes after infection would be especially useful.

Meanwhile, clinicians might be wondering what protects “healthy” patients with pneumonia who take

statins from adverse outcomes, if it is not statins. Because most frail patients will not be admitted to high tech intensive care units in specialised institutions or enrolled in costly trials,¹³ observational studies will remain essential to shape strategies to improve the outcome of these severe infections.

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Treatment of knee pain in primary care

Pharmacists and physiotherapists need to be a part of the team

Research p 995

In the United Kingdom, general practitioners have traditionally been seen as the key players in primary care delivery, with support from a multidisciplinary team. As primary care extends its remit into areas such as minor surgery, team members are likely to come from diverse health disciplines. Recent studies show that patients presenting to primary care with knee pain receive little information on pain management, rehabilitation,¹ or use of non-steroidal anti-inflammatory drugs and few are referred to specialist services.² In this week's *BMJ*, a trial by Hay and colleagues assesses the impact of pharmacy and physiotherapy on the management of older people with pain or stiffness of one or both knees in primary care.³

The trial compared three interventions: enhanced pharmacy review (pharmacological management in accordance with an algorithm), community physi-

otherapy (advice about activity and pacing and an individualised exercise programme), and standard treatment (control; advice leaflet reinforced by telephone call). Compared with standard treatment at three months, pharmacy review and physiotherapy improved pain and function scores, improved patient satisfaction, and reduced use of non-steroidal anti-inflammatory drugs. Importantly, neither of the interventions had adverse effects.

The findings are encouraging, but the effects were not sustained beyond three months, which may be because adherence to treatment diminished over time. This could not be assessed, however, as measurement of adherence was limited. As with any trial, fidelity to the intervention (adherence),⁴ on the part of people who provide the intervention and those who receive it, is always an important consideration. Also the “dosage” of the intervention and the requirement for

BMJ 2006;333:981-2

top-up treatments may have been too low to produce long term benefits.³ Benefits have been shown to be additive when exercise is delivered with other interventions, such as weight loss strategies.⁵ If the pharmacy and physiotherapy interventions had been combined instead of being given separately they may have been more effective.

The role of pharmacists in helping patients to manage medication is widely accepted, and prescribing rights have been extended to pharmacists.⁶ Physiotherapy for musculoskeletal conditions has been shown to be beneficial and cost effective in primary care.⁷ A systematic review has shown that substituting general practitioners (GPs) with appropriately trained nurses can produce comparable health outcomes for patients.⁸ What was less clear was the impact on doctors' workload and potential cost savings. Another study found that nurse practitioners did not reduce the workload of GPs,⁹ perhaps because they were being used as supplements rather than substitutes for GP care. The trial by Hay and colleagues did not report effects on GPs' workload, but it did note that during the six month follow-up more people in the control group consulted their GP for knee pain than did those in the other two groups.

Evidence suggests that factors that promote success in changing skill mixes include introducing services or treatments of proved efficacy; appropriate staff education and training; removal of unhelpful boundary demarcations between staff or service sectors, such as lack of integration between health and social care; appropriate pay and reward systems; and good strategic planning and human resource management.¹⁰ The approach described by Hay and colleagues hits the mark on the first two criteria (evidence based treatments and education and training), but implementation of the others would require changes on a much broader scale for implementation across trusts.³

The pharmacy intervention was delivered by a pharmacist in GP surgeries. Could the intervention be delivered in a community pharmacy? Research suggests that the community pharmacy setting is not viewed positively as a site for the delivery of more clinically demanding services.¹¹ Physiotherapy was performed under supervision of community physiotherapists (mean of three consultations), and patients were

asked to continue their exercises at home. Supervised exercise sessions are superior to home exercises in the management of knee injury,¹² and although one to one supervision is best, group classes can be successful. This approach requires a specific diagnosis (beyond knee pain and stiffness as was used in Hay and colleague's model) as patients are usually grouped according to injury type and prognosis. None the less, group sessions could maximise patient compliance and therapist time in the long term and offer a pragmatic option for primary care management.

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Osteonecrosis of the jaw after treatment with bisphosphonates

Is irreversible, so the focus must be on prevention

New generation bisphosphonates such as zoledronic acid, pamidronate, and alendronic acid have various indications in medicine. Initially, their use was restricted to patients with metastatic bone malignancy secondary to breast cancer, lung cancer, prostate cancer, or multiple myeloma. Their benefit in these conditions led to wider application for other bone pathologies, such as osteoporosis and Paget's disease.¹ Their main effect is to inhibit osteoclast activity;

however, they also seem to have antiangiogenic effects,² and once they are incorporated into the bony matrix, degradation is minimal.³

Reports from several hundred cases over the past three years suggest that long term use of new generation bisphosphonates increases the risk of avascular osteonecrosis of the jaws.⁴⁻⁶ The mean onset time of osteonecrosis after the treatment is started is one to three years.⁶ The clinical picture consists of non-

BMJ 2006;333:982-3

healing ulcerated oral lesions and visible necrotic bone, which are sometimes associated with a diffuse jaw or facial pain. Osteonecrotic side effects are relatively rare in patients taking these drugs, and risk is related to the type of drug and the doses given (incidence estimated 1-10%).⁷ Although rare, these side effects are clinically difficult to manage.⁶ Such side effects should be considered when new generation bisphosphonates are prescribed for patients without cancer who have better long term survival and thus increased risk of developing delayed osteonecrosis.⁸

So, is it possible to prevent avascular osteonecrosis? Two recent studies concluded that it cannot be avoided completely.^{6,8} These studies identified (potentially modifiable) risk factors that increased the risk of avascular maxillo-mandibular osteonecrosis, such as poor dental hygiene, periodontal problems, dental extractions, and oral surgery.

Currently, discontinuation of new generation bisphosphonates, treatment with long term antibiotics, and careful surgical debridement may limit osteonecrosis, but no treatment can totally reverse it. We therefore recommend that patients should be referred for a specialist dental or maxillofacial opinion, so that chronic periodontal problems and foreseeable dental extractions can be considered before treatment is started. The importance of good dental hygiene should be emphasised, and patients should be made fully aware of the benefits and harms so that they can

make an informed decision about whether they should start treatment.

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What should we do about climate change?

Health professionals need to act now, collectively and individually

Action on climate change has been likened to teenage sex. Everyone claims to be in on the action, but only a few are, and those not very effectively. Given the scientific consensus that global warming—the underlying cause of climate change—is mainly caused by human beings^{1,2} and its effects are likely to be seriously damaging to global health,^{3,4} citizens and governments must take much more effective action. This sense of urgency has been confirmed by the Stern report, commissioned by the UK chancellor, Gordon Brown, and published last week.⁵ It concludes that the cost of doing something to combat climate change is likely to be 1% of global gross domestic product, but the cost of doing nothing will be up to 20% of global gross domestic product. It also concludes that the cost to the environment of each ton of carbon dioxide emitted is £50 (€75; \$95), a figure that gives us a financial yardstick of the damage we are doing by our continued reliance on fossil fuels.

Health professionals have a track record of identifying and helping resolve serious public health issues. We are well placed to have a leadership role. Indeed it is a role that we cannot shirk. So what should we do? The *BMJ* has set up a carbon council with the objective of harnessing the intelligence and imagination of health professionals to expedite the transition to a low carbon world (see bmj.com for list of council members).

The council's strategy is fourfold. Firstly, to recruit as many health professional as possible to act and act now. Although the global effects of climate change and benefits of resolving these are well known,^{6,7} many doctors and other health professionals have not articulated for themselves and others the public health priority of climate change compared, for example, with smoking and inequalities in health. This is alarming, given that climate change related rises in sea level and changing food growing patterns will lead to massive social disruption, with the increased likelihood of resource wars, the spread of many "tropical" diseases, and a greatly increased burden of ill health. The *BMJ's* contribution will be to present the evidence for the health damaging impacts of climate change, both in the developed and developing world, and the health benefits of moving towards low carbon living.

Secondly, we want to identify the most effective low carbon policies that when implemented will reduce greenhouse gas emissions. The *BMJ's* climate change issue in June of this year offered examples of such policies,⁸ which must ensure welfare development for the global poor at the same time as controlling carbon emissions. Of several possible approaches, contraction and convergence is our favoured option.^{9,10} Adoption of this policy would create a global carbon budget, with a phased reduction over the next 30 years (to tackle global warming), and an equal per capita allocation of



DIETER TELEMANS/PANOS

carbon entitlements. Frugal emitters, essentially the world's poor, could sell their unused entitlements to excessive emitters, the rich, thereby enhancing the welfare of the poor as well as creating incentives for the excessive emitters to reduce emissions. Another professionally concerned group, the Royal Institute of British Architects, has recently adopted contraction and convergence as its favoured framework.¹¹ We welcome readers' views on the workability of this policy option compared with other options you may be aware of.

Thirdly, we aim to establish a coalition of health professionals to act as policy advocates nationally and internationally. Advocacy will be directed at the organisations within which we work—particularly the health service—at governments, and at business, all of which have good reason to tackle climate change. The *BMJ* is already exploring how best to become carbon neutral and will encourage all other health facilities to do likewise. We will invite other medical journals, the UK royal colleges and health related professional associations, academics, and policy makers to work together to create what will be a powerful force for change.

Finally, the council will encourage individual lifestyle change among health professionals around the world. This is part of the strategy—not because we have any illusions about the contribution of individual behavioural change to the overall problem of global climate change—but because it is vital that health professionals lead by example. As a start, we invite you to

estimate the carbon emissions for which you are personally responsible by registering on www.rsacarbonlimited.org and signing up to CarbonDAQ, and then to commit to reducing your emissions each year. To make this commitment stick, and to ensure that it brings appropriate benefit, we are establishing a scheme in conjunction with the Royal Society of Arts. This scheme asks you to reduce your individual emissions by 5% a year and to pay £25 for each ton of carbon dioxide you emit in excess of the average UK personal emission of five tons into a development fund. The money raised will support low carbon projects in the yet to be industrialised world. We will contact those of you who complete the Royal Society of Arts profile and ask you to join this part of the scheme.

By personal and collective action health professionals can contribute to the health of our own and future generations. By contributing your ideas, deploying your advocacy skills, and making your personal commitment you will join us to create a new breed of climate concerned health professionals. We can then justly say to our descendants that we played our part in preserving the integrity of our beautiful but fragile world.

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